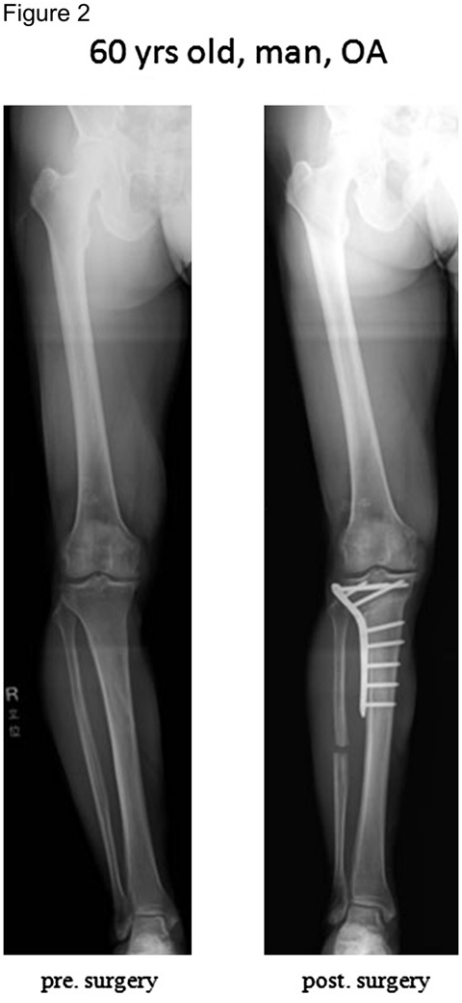
Figure 2



311
TWO YEAR POST-ARTHROSCOPY OUTCOMES IN PATIENTS UNDERGOING PARTIAL MENISCECTOMY: THE INFLUENCE OF SYNOVIAL INFLAMMATION

C.R. Scanzello [1], A. Albert [2], E. DiCarlo [3], K.B. Rajan [1], E.U. Asomugha [4], V. Kanda [1], B.H. Swaim [2], P. Weitzel [2], J.C. Richmond [2], S.R. Goldring [3], B. McKeon [2]. [1] *Rush Univ. Med. Ctr., Chicago, IL, USA;* [2] *New England Baptist Hosp., Boston, MA, USA;* [3] *Hosp. for Special Surgery, New York, NY, USA;* [4] *Cleveland Clinic, Cleveland, OH, USA*

Purpose: Synovitis is a variable feature of knee OA, but has been reported in up to 86% of patients with radiographic OA, and is associated with symptom levels and progression of disease. We previously showed that synovitis detected by biopsy is also a frequent feature in patients with meniscal tears undergoing arthroscopic partial meniscectomy, even in the absence of radiographic changes. Despite no radiographic evidence of OA, 80% of these patients had evidence of early-stage cartilage degeneration when examined intra-operatively. Synovitis correlated with pre-operative symptom severity in these patients, and was associated with a specific pattern of chemokine expression (IL-8, CCL5, CCL19 and CCR7). These patients were followed longitudinally post-arthroscopy to determine whether the presence of synovitis predicts knee symptoms up to 2 years post-operatively.
Methods: Thirty-three patients scheduled for arthroscopic partial meniscectomy with a history of knee injury, a meniscal tear identified on pre-operative MRI, but without radiographic evidence of knee OA were recruited from the Orthopedic practices at the New England Baptist Hospital. Cartilage integrity was evaluated intra-operatively and graded using the Outerbridge classification. Symptoms were assessed with the Lysholm score, which measures knee-specific symptoms and dysfunction on a scale of 0 to 100, with 0 indicating the worst symptoms/dysfunction and 100 indicating absence of symptoms. Lysholm scores were collected pre-operatively, and post-operatively at 16 weeks, 1 year and 2 years. A total of 28 patients completed the 2 year follow-up. Synovial biopsies were taken at the time of surgery, and synovitis scored on Hematoxylin & Eosin stained sections using a semi-quantitative scoring system. We used a linear mixed effects model to study whether synovitis impacted Lysholm scores over time, adjusting for age, BMI, gender and cartilage Outerbridge score.
Results: There were significant improvements from the pre-operative baseline Lysholm scores at all three post-operative time points (Kruskal-Wallis $p<0.0001$), with a mean (+/-SD) improvement at 2 years of 27 (+/-16) points. Despite having worse pre-operative Lysholm scores (Mann Whitney $p= 0.0008$), patients with synovitis did not generally have worse Lysholm scores compared to patients without in follow-up ($p>0.05$). Given lower pre-operative Lysholm scores, synovitis was associated with greater improvement in scores over time, adjusting for age, BMI, gender and cartilage score ($p=0.003$ at 16 weeks, $p=0.026$ at one year, and $p=0.030$ at two years). The mean 2-year Lysholm scores did not differ significantly between patients with or without synovitis ($p=0.31$). However, four of twelve (33%) patients with synovitis had Lysholm scores below 80 at two years, compared with one of sixteen (6%) without synovitis. Patients with synovitis were less likely to have Lysholm scores > 80 at two years post-op (adjusted OR 0.02, 95% confidence interval 0.00 to 0.81). Conclusion: In this pilot study of patients undergoing arthroscopic partial meniscectomy, patients with synovitis had significantly worse Lysholm scores at baseline, and demonstrated greater improvements in follow-up, indicating that the presence of synovitis does not preclude a favorable response to surgical intervention up to 2 years post-operatively. However, the patients with synovitis were less likely to have Lysholm scores indicating only mild symptoms (above 80) compared to patients without synovitis at 2 years post-operatively. As the majority of patients in this pilot study did well, larger numbers and longer follow-up may be needed to determine whether the presence of synovitis predicts less favorable long-term outcomes.

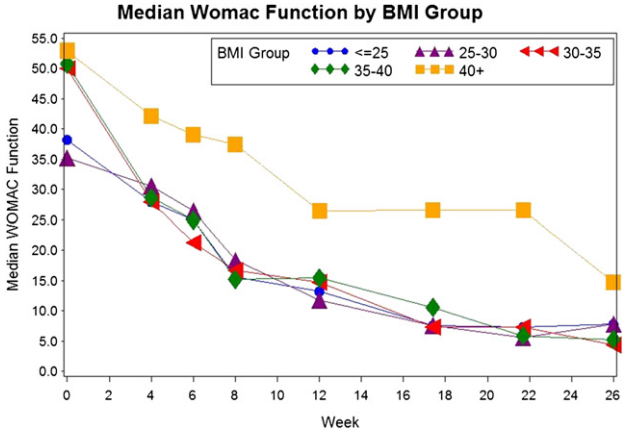
312
TRAJECTORIES OF FUNCTIONAL RECOVERY POST TKR: DOES BMI MATTER?

E. Losina, J. Collins, V. Lerner, W.M. Reichmann, J. Wright, R. Ghazinouri, L. Donnell-Fink, J.N. Katz. *Brigham and Women's Hosp., Boston, MA, USA*

Purpose: More than 600,000 total knee replacements (TKRs) are performed in the US annually including many on persons who are obese. Published data on whether obesity adversely affects outcomes of TKR are conflicting. Most studies have focused on perioperative complications; little is known about whether obese and non-obese TKR recipients differ in pre-operative clinical characteristics, nor about whether obesity affects trajectory of post-TKR functional recovery.
Methods: We conducted a prospective cohort study of consecutive patients undergoing TKR at a tertiary medical center. Subjects were followed with phone surveys bi-weekly during the first two months and monthly during the subsequent four months. We stratified subjects by BMI as normal weight ($BMI<25$), overweight ($25\leq BMI<30$), obese ($30\leq BMI<35$), severely obese ($35\leq BMI<40$) and morbidly obese ($BMI\geq 40$). We examined whether demographic and clinical characteristics of obese persons undergoing TKR differ from those who are not obese. We also evaluated functional trajectories among those who are and are not obese. In addition we examined whether obesity influenced inpatient costs.
Results: Out of 116 subjects enrolled, 50% were obese ($BMI\geq 30$ kg/m2) and 19% were severely or morbidly obese ($BMI\geq 35$ kg/m2). Age at TKR did not differ by obesity status. Among women 29% were severely or morbidly obese compared to 9% among men. Higher BMI prior to TKR was associated with worse baseline functional status and greater pain scores. In general, irrespective of obesity status, all groups achieve substantial functional improvement (Figure). The absolute improvement was greater in those with higher BMI over the 6 month post-TKR recovery period. Those who

were morbidly obese had the worst preoperative functional status and gained functional improvement slower compared to other groups, but by 6 months had improved by 35 points. Obesity status did not affect inpatient costs.

Conclusions: While TKR recipients with higher BMI have worse preoperative functional status and pain, 6 months post TKR they achieve similar functional results as those with lower BMI, at similar inpatient cost. These data should be used in discussing outcomes of TKR among obese persons with end stage knee OA.



313
RELIABILITY OF HIP EXAMINATION TESTS FOR FEMOROACETABULAR IMPINGEMENT (FAI)

C.R. Ratzlaff[1], J. Simatovic[2], H. Wong[3], L. Li[4], A.M. Ezzat[3], D.P. Langford[5], J.M. Esdaile[4], C. Kennedy[6], P.P. Embley[7], D.F. Caves[8], T. Hopkins[9], J. Cibere[4]. [1]*Brigham and Women's Hosp./Harvard Med. Sch., Boston, MA, USA;* [2]*Arthritis Res. Ctr. of Canada, Vancouver, BC, Canada;* [3]*Univ. of British Columbia, Vancouver, BC, Canada;* [4]*Arthritis Res. Ctr. of Canada/Univ. of British Columbia, Vancouver, BC, Canada;* [5]*Vancouver Coastal Hlth., Vancouver, BC, Canada;* [6]*Treloar Physiotherapy Clinic, Vancouver, BC, Canada;* [7]*Advanced Physiotherapy, White Rock, BC, Canada;* [8]*GF Strong Rehabilitation Ctr., Vancouver, BC, Canada;* [9]*Allan McGavin Sports Med. Ctr., Vancouver, BC, Canada*

Purpose: Recently it has been suggested that femoroacetabular impingement (FAI) may be a modifiable precursor to osteoarthritis. Large population-based studies are required to investigate this, however little is known of the reliability of clinical exam tests for FAI. This study aimed to assess the inter-rater reliability of hip exam tests used to assess FAI among rheumatologists and physiotherapists.

Methods: Twelve subjects with varying levels of hip pain, and presence or absence of an FAI deformity, were examined by nine clinicians (2 rheumatologists; 7 physiotherapists) with varying degrees of experience in hip and FAI examination. Examiners were blinded to subject history. Each examiner assessed both hips of each subject using 12 hip tests drawn from an extensive review of the literature and consultation with experts in FAI (Table 1 and 2). To emulate clinical practice, examiners were provided with an instruction sheet without an additional standardization session. The order of hip exams was randomized by selecting 9 columns (examiners) from a 12 x 12 Latin square design. The order of examination of the two hips within each subject was also randomized. Inter-rater reliability (IRR) for the 10 categorical test outcomes (absence of pain/presence of pain/unable to assess or full ROM/restricted ROM/unable to assess) was summarized using overall raw agreement (ORA). An ORA of $>$ 0.75 was considered to indicate adequate reliability. For the two continuous (flexion and internal rotation ROM) outcomes, IRR was summarized using the median of the absolute difference (MAD) in measurements obtained by any two examiners on any patient. MAD is a reflection of the "typical" difference (in degrees) between two raters. Confidence intervals were obtained through bootstrapping.

Results: Adequate reliability was achieved for 6 of the 10 hip exam tests with categorical outcomes (Table 1). Results for the continuous test outcomes are presented in Table 2. On average, examiners were within 5 degrees of each other for flexion, and 7 degrees for internal rotation.

Table 1: Overall raw agreement of categorical test outcomes.

Examination	Overall raw agreement (95% CI)
Log roll test	0.99 (0.96,1.00)
FABER test	0.84 (0.75,0.95)
Hip internal rotation pain	0.84 (0.74,0.96)
Posterior impingement test	0.81 (0.69,0.94)
Flexion 120°/Adduction/Internal rotation pain	0.78 (0.68,0.92)
Flexion 90°/Adduction/Internal Rotation Pain	0.76 (0.66,0.91)
Flexion 90°/Adduction/Compression pain	0.70 (0.59,0.87)
Flexion 120°/Adduction/Compression pain	0.69 (0.61,0.85)
Flexion 90°/Adduction/Internal rotation ROM	0.67 (0.60,0.83)
Flexion 120°/Adduction/Internal rotation ROM	0.58 (0.52,0.75)

Table 2: Median absolute difference for continuous test outcomes.

Examination	Median absolute difference (95% CI)
Hip flexion ROM	5° (3°,6°)
Hip internal rotation ROM	7° (4°,9°)

Conclusions: Among this group of 9 examiners, reliability for FAI tests had an overall raw agreement of between 0.58 and 0.99. The 4 tests below 0.75 were not familiar to most clinicians in this study and are not well-described in the literature. Further, patients were subjected to 9 consecutive hip exams - variation in pain and range of motion during the course of the exams may have resulted from physiologic changes secondary to repetitive manipulation. Our results suggest that commonly used hip exam tests for FAI can be performed with adequate reliability, without employment of a pre-study exam standardization session and using examiners that did not all routinely examine hips or use goniometers. The application of these findings to future FAI studies will contribute to improved subject screening and outcome assessments of FAI.

314
HIGH PREVALENCE OF METABOLIC SYNDROME IN PATIENTS WITH HAND OSTEOARTHRITIS IN A PRIMARY CARE SETTING

C. Orellana, N. Navarro, J. Calvet, M. García-Manrique, J. Gratacós, M. Larrosa. *Hosp. de Sabadell (Parc Taulí), Sabadell, Spain*

Patients with knee osteoarthritis (OA), due to age, walking functional impairment and/or a high prevalence of obesity, are at a high risk of metabolic disorders and cardiovascular (CV) comorbidities. However, hand OA (HOA) usually affect a younger population and is not so clearly associated with obesity or other conditions linked to cardiovascular risk.

Purpose: To evaluate the frequency of metabolic disorders and CV comorbidity in patients with symptomatic HOA referred to a rheumatologist in a primary care setting.

Methods: Consecutive patients aged >50 y referred period to a rheumatology practice in a primary care setting because of HOA during a 12-month period. Diagnostics related to CV comorbidity and/or glycemic or lipid disorders (hypertension, diabetes, ischemic heart disease, heart failure, cerebrovascular disorder, venous insufficiency or dyslipemia) were obtained for each patient from the computerized data base (e-cap system) used by their family physicians. Patients with soft tissue disorders (e.g. shoulder tendinitis, plantar fasciitis, etc) adjusted for age were used as control group.

Results: Eighty-seven patients with HOA and 254 with soft tissue conditions were included in this cross-sectional study. Seventeen patients with HOA were excluded for the analysis because of concomitant knee and/or hip OA, leaving 70 patients with OA only in hands to be analyzed. No differences were found between both groups regarding age or gender. The frequencies of hypertension, hyperglycemia/diabetes and dyslipemia were